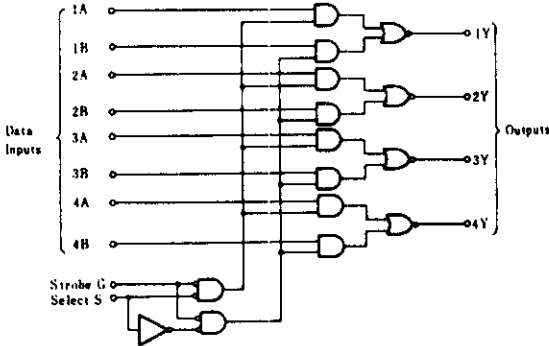


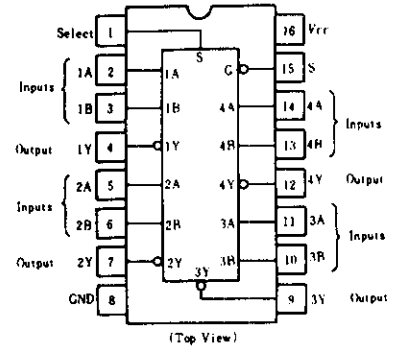
# HD74LS158 • Quadruple 2-line-to-1-line Data Selectors/Multiplexers (inverted outputs)

This data selector/multiplexer contains inverters and drivers to supply full on-chip data selection to the four output gates. A separate strobe input is provided. A 4-bit word is selected from one of two sources and is routed to the four outputs. Then, outputs present inverted data to minimize propagation delay time.

## ■ BLOCK DIAGRAM



## ■ PIN ARRANGEMENT



## ■ FUNCTION TABLE

| Inputs |        |   |   | Output |
|--------|--------|---|---|--------|
| Strobe | Select | A | B | Y      |
| H      | X      | X | X | H      |
| L      | L      | L | X | H      |
| L      | L      | H | X | L      |
| L      | H      | X | L | H      |
| L      | H      | X | H | L      |

H; high level L; low level, X; irrelevant

## ■ ELECTRICAL CHARACTERISTICS ( $T_a = -20 \sim +75^\circ\text{C}$ )

| Item                         | Symbol   | Test Conditions   | min                                    | typ* | max  | Unit |               |
|------------------------------|----------|---|--|------|------|------|---------------|
| Input voltage                | $V_{IH}$ |   | 2.0                                    | —    | —    | V    |               |
|                              | $V_{IL}$ |   | —                                      | —    | 0.8  | V    |               |
| Output voltage               | $V_{OH}$ | $V_{CC}=4.75\text{V}, V_{IH}=2\text{V}, V_{IL}=0.8\text{V}, I_{OH}=-400\mu\text{A}$ | 2.7                                    | —    | —    | V    |               |
|                              | $V_{OL}$ | $V_{CC}=4.75\text{V}, V_{IH}=2\text{V}, V_{IL}=0.8\text{V}$                         | —                                      | —    | 0.4  | V    |               |
|                              |          | $I_{OL}=4\text{mA}$   | —                                      | —    | 0.5  |      |               |
| Input current                | G, S     | $I_{IH}$  | $V_{CC}=5.25\text{V}, V_I=2.7\text{V}$ | —    | —    | 40   | $\mu\text{A}$ |
|                              |          |   |  | —    | —    | 20   |               |
|                              | A, B     | $I_{IL}$  | $V_{CC}=5.25\text{V}, V_I=0.4\text{V}$ | —    | —    | -0.8 | mA            |
|                              |          |   |  | —    | —    | -0.4 |               |
|                              | G, S     | $I_I$   | $V_{CC}=5.25\text{V}, V_I=7\text{V}$   | —    | —    | 0.2  | mA            |
|                              |          |   |  | —    | —    | 0.1  |               |
| Short-circuit output current | $I_{OS}$ | $V_{CC}=5.25\text{V}$   | -20                                    | —    | -100 | mA   |               |
| Supply current **            | $I_{CC}$ | $V_{CC}=5.25\text{V}$   | —                                      | 4.8  | 8    | mA   |               |
| Input clamp voltage          | $V_{IK}$ | $V_{CC}=4.75\text{V}, I_{IN}=-18\text{mA}$  | —                                      | —    | -1.5 | V    |               |

\*  $V_{CC}=5\text{V}, T_a=25^\circ\text{C}$

\*\*  $I_{CC}$  is measured with all outputs open and all inputs at 4.5V.

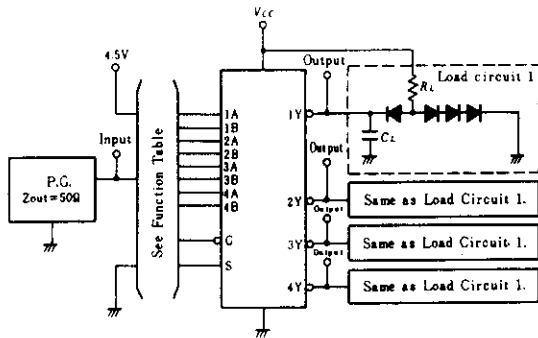
# HD74LS158

## SWITCHING CHARACTERISTICS ( $V_{CC}=5V$ , $T_a=25^{\circ}C$ )

| Item                   | Symbol    | Inputs | Output | Test Conditions             | min | typ | max | Unit |
|------------------------|-----------|--------|--------|-----------------------------|-----|-----|-----|------|
| Propagation delay time | $t_{PLH}$ | Data   | Y      | $C_L=15pF$ , $R_L=2k\Omega$ | —   | 7   | 12  | ns   |
|                        | $t_{PHL}$ |        |        |                             | —   | 7   | 12  |      |
|                        | $t_{PLH}$ | Strobe | Y      |                             | —   | 11  | 17  | ns   |
|                        | $t_{PHL}$ |        |        |                             | —   | 12  | 18  |      |
|                        | $t_{PLH}$ | Select | Y      |                             | —   | 13  | 20  | ns   |
|                        | $t_{PHL}$ |        |        |                             | —   | 16  | 24  |      |

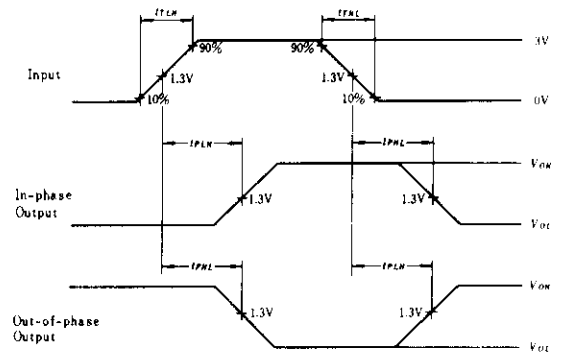
## TESTING METHOD

### 1) Test Circuit



- Notes) 1.  $C_L$  includes probe and jig capacitance.  
 2. All diodes are 1S2074 (H).

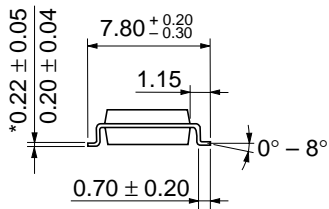
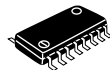
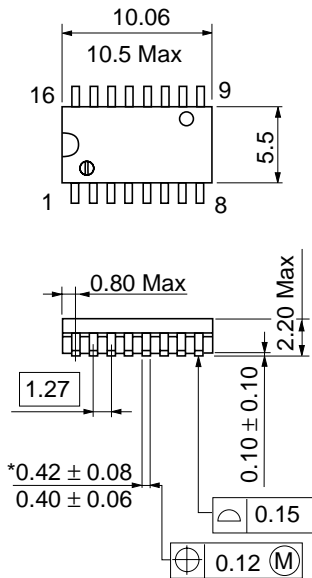
### Waveform



Input pulse:  $t_{TLH} \leq 15ns$ ,  $t_{THL} \leq 6ns$ ,  
 $PRR=1MHz$ , duty cycle 50%.



|                          |          |
|--------------------------|----------|
| Hitachi Code             | DP-16    |
| JEDEC                    | Conforms |
| EIAJ                     | Conforms |
| Weight (reference value) | 1.07 g   |



\*Dimension including the plating thickness  
Base material dimension

|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-16DA  |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.24 g   |



\*Dimension including the plating thickness  
Base material dimension

|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-16DN  |
| JEDEC                    | Conforms |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.15 g   |

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